THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Impact Assessment of Past Capstone Projects

Autumn 2021

AEDE 4567 Capstone Final Report

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I. Executive Summary

For fourteen semesters, students in the Environment, Economy, Development, and Sustainability (EEDS) major have developed capstone projects in relation to various sustainability topics to be implemented throughout Columbus. This research project aims to assist the College of Food, Agriculture, and Environmental Science (CFAES) in assessing the impact of a selection of previous capstone projects proposed. To reach this goal, we established research objectives to gather baseline knowledge, determine parameters of success, and propose the best method to maximize effective practices in future capstone projects.

There are about 70 EEDS capstone projects accessible in the OSU Knowledge Bank (KB), which is the resource used to archive past proposals. Narrowing the scope to focus on a few projects gave us the greatest opportunity to complete comprehensive analyses. To aid in our evaluations, we selected two or three projects from each of the seven categories we created for further research. The seven categories include projects from different fields such as transportation, Ohio State University (OSU), energy, sustainable city, recycling and waste reduction, sustainable food, and health. The categories often overlap, so we categorized projects according to their objectives. We also looked into international attention which records the number of downloads for each project report and source country for further consideration.

The primary findings of our research of past capstone projects found that the written reports can only tell you so much, considering that they primarily consist of quantitative information. External influences play a role in research and implementation of recommendations, which are not documented in the reports. The COVID-19 pandemic caused significant changes to multiple projects, which hindered project feasibility and prevented implementation of

recommendations. Even so, we concluded that student recommendations play a role in policy implementation within local governments and the higher education system.

The recommendations for future EEDS capstone sessions, include deeper investigation into past capstone projects. Specifically, we recommend that a group conduct an investigation of foreign policy in terms of download data from the KB. Recommendations also include the creation of interdisciplinary projects through collaboration with other colleges in order to incorporate more aspects of the university and its impacts. Our final recommendation is that a system be created in which project partners give feedback post-project to update the group and instructors on relevant implementation progress.

II. Introduction

The goal of this research project is to assess the impact and legacy of a selection of previous Environment, Economy, Development and Sustainability (EEDS) capstone projects to date. Through this assessment, we will conduct an analysis to highlight a subset of those impacts and make recommendations for future EEDS capstone projects. Autumn semester of 2021 is the 14th offering of the EEDS capstone course. These projects have responded to Requests for Proposals across various topics and agencies, including the City of Columbus Mayor's Green Team and City Environmental Steward, Smart Columbus, the Columbus Partnership, Green Columbus, the City of Worthington and the Old Worthington Partnership, the OSU Offices of Energy and Environment; Energy Services and Sustainability; OSU; the OSU Sustainability Institute; OSU Wexner Medical Center; and OSU School of Environment and Natural Resources.

We divided this abundance of projects access in the Knowledge Bank into seven categories:

1. Transportation
2. OSU
3. Energy
4. Sustainable Food
5. Sustainable City
6. Recycling and Waste Reduction
7. Health

To make the volume of projects under consideration more feasible for our timeline, we chose to focus on two projects from each category. This allowed deeper analysis and more detailed research of the selected projects, and we recommend that future capstone groups continue to analyze additional projects.

III. Methods

Our project was conducted primarily through reviewing project reports in the Knowledge Bank and interviewing past project partners, former students, and previous capstone professors. While reviewing the projects from the KB, we initially looked for projects that had primarily quantitative results. After our first few interviews, we quickly shifted to a more holistic approach to project impact evaluation.

We reached out to prior partners and students via email, gaining contact information from the projects in the KB and through LinkedIn. Our interview with our project collaborator, Dr. Hitzhusen, who is the professor of the OSU capstone class, was extremely important in outlining the methods that would characterize how we structured our research going forward. In terms of metrics, he explained how the number of capstone report downloads and views listed in the KB are equally important compared to local impacts. The project labeled Telecommuting: Smarter

Workplaces (Spring 2020), for example, had the highest number of recorded downloads per capstone project, with 5,168 downloads in the past 6 months. This inclusion of project meta data greatly helped us narrow down projects to choose for closer examination, and helped to pick the two projects in each category.

Once a potential project was highlighted, we reached out to previous partners or students associated with the project and arranged interviews over Zoom. Interviewees were asked questions about their experience with the capstone program, how they felt about the project in question, and the impacts of the project. The feedback we received consistently throughout the interviewing process was that the projects were a welcome process by the partners working with OSU, but also that impacts were difficult to fully assess quantitatively. Many projects could have had high-quality results, but the partner's situation at the time, through external circumstances such as funding or the COVID-19 shutdowns for more recent projects, inhibited the full implementation of student recommendations.

IV. Interviewing

While our team reviewed reports of past capstone projects, we determined that contacting past project stakeholders, including EEDS alumni, faculty, and collaborators, would enhance our understanding of both qualitative and quantitative impacts of past projects. Our interviews with Dr. Hitzhusen, Bruce Braine, Brett Baughman, Matt Griffin, Sarah Fischer, Carolyn Voigt, Helena Rudoff, Aparna Dial, Alex Slaymaker, Joanne Dole, and Tony Gillund were comprehensive and provided us with nuanced perspectives of past and current projects. Such information is incredibly valuable to faculty within the School of Environment and Natural Resources, as these individual experiences and insights have not been previously recorded within the KB. Some information we have gathered from conducting interviews includes correlation

between project success and future student employment with partner organizations upon completion of projects, perceptions of relative project success, and implementation of project recommendations in public policy.

A. EEDS Professors, Past and Present

Before we began conducting formal interviews, our professor and primary stakeholder, Dr. Greg Hitzhusen, gave a general overview of past EEDS capstone projects and told us which projects he deemed most impactful upon completion. After providing us with names of past collaborators, he encouraged us to also contact current collaborators who have worked with capstone students throughout multiple semesters.

Bruce Braine, a former EEDS Capstone professor, enjoyed working with students and assisting with their professional development. He agreed with other interviewees regarding the telecommuting and utility-scale solar projects' relative success and impacts, adding that concrete, measurable data that can be easily visualized is preferred when creating recommendations for stakeholders to implement. Bruce recalled how the solar project's objectives and goals remained constant throughout the research phases, while the telecommuting project's original focus needed modification in response to the COVID-19 pandemic. This, he explained, is the reality of the current professional world. Flexibility is a valuable characteristic employers seek in consulting, engineering, and other fields.

B. Alumni

Brett Baughman, an EEDS alum, told our team about his experiences with Green Memo III, or the Columbus Green Community Plan. His team's recommendations to the city council included proposed solutions to climate change at the local level, using quantifiable metrics and prices of measurable ecological damage. Brett mentioned that his group's recommendations were

so comprehensive that they were included in the published plan. Applying classroom knowledge in valuable ways, such as monetizing ecosystem services and conducting cost-benefit analyses for stakeholders' review, allows students to contribute to their collaborators' organizations through their capstone projects.

As an EEDS alum and the Program Coordinator of Sustainability Education at OSU, Matt Griffin had a wealth of experience to share with us. His capstone project, Identifying Barriers to Linden Energy Savings Program (Spring 2019), explored the efficacy of the Community Energy Savers (CES) program in the city of Linden and identified gaps in residents' participation in CES. Even though the study produced well-rounded results, residents of Linden expressed discontent in being scrutinized, as other student groups had surveyed the area frequently throughout the year. Matt stated that in cases like this, examining what students learned, as opposed to a project's relative success, is crucial for understanding the next steps that should be taken in terms of community relations. According to him, measurable impacts of capstone projects can be determined in terms of the projects' value to students, clients, and the socio-cultural environment the project affects. Even if a capstone project has no communal impacts, however, the knowledge gained from conducting research can provide a foundation for future groups to access and utilize in future projects. This last metric is difficult to quantify during one semester, which necessitates legacy projects to continue the research that some groups start.

When we met with Sarah Fischer, a graduate of the EEDS program, her former classmates Helena Rudoff and Carolyn Voigt joined the call and recounted their respective capstone experiences. Smart Columbus hired Sarah one year after the successful completion of her team's capstone project, Market Analysis of Barriers to Electric Vehicle Adoption, Helena went to graduate school, and Carolyn joined the Peace Corps following graduation. After Helena

completed her advanced degree, she joined an electric vehicle company and has collaborated with Sarah on several energy-efficiency projects. Both Sarah and Helena agree that their capstone project supported their individual career paths and are grateful for the experience and lasting connections they have made because of the project.

Carolyn's professional journey took a different route than Sarah's and Helena's, but the skills she gained while conducting surveys as part of capstone research served her well in her career. Since graduating from OSU, she has worked on public health projects focused on reducing COVID-related health burdens after her time with the Peace Corps and is pursuing a Master's in Public Health to further advance her opportunities. In graduate school coursework, she often uses "systems thinking" approaches, which were common themes throughout her undergraduate career. Her recommendations to current EEDS students include being a "jack of all trades," finding realistic and measurable goals for projects, and, whenever possible, building a team with a synergistic responsibility dynamic. If one or more team members cannot do as much work as others, assess their strengths and allocate however many duties they can feasibly handle.

C. Past and Current Collaborators

The first project collaborator we interviewed, Aparna Dial, has been fundamental in implementing the current "Living Laboratory" atmosphere on OSU's campus. Her recollections of past projects ranged from engineering capstones to city and regional planning students' collaborations. From her perspective, both students and staff who display innovative curiosity deserve support in achieving their goals as members of OSU's community. A staff groundskeeper, for example, helped create a grant that improved the efficiency of electric equipment, and student researchers within the College of Engineering can apply for this grant.

One of Aparna's main points in terms of project impacts involved recognizing how interconnected campus operations are. In other words, EEDS capstone recommendations do not impact only West Campus or the communities, including Linden and Worthington, where student recommendations are requested to resolve local challenges. Even though the university's respective colleges may appear to operate independently at times, each institution affects OSU as a whole to some degree. Aparna suggested how each school would benefit immensely from interdisciplinary undertakings, provided that logistics between administrative faculty groups occur efficiently and equitably.

As a returning collaborator, Alex Slaymaker had glowing reviews of past project groups and witnessed impacts of partnerships firsthand. Her favorite project, Incentives for Utility-Scale Solar, was successful due to the team's thorough research, professionalism, punctual correspondence, and dedication to their stakeholders. She told us about how the current Smart Columbus Sustainability Fellow, a former member of the Utility-Scale Solar student team, was hired following their graduation. According to Alex, hands-on experience in professional settings, albeit intangible, is a noteworthy facet of students' professional development and a main objective of capstone curriculum.

Joanne Dole was in charge of spearheading multiple EEDS capstone projects associated with the City of Worthington from 2016 to 2017. During the Fall 2016 semester, EEDS capstone projects focused exclusively on Worthington initiatives. This method of assigning projects did not work well, as Worthington had fewer resources, and a smaller budget, than Columbus proper. To assist their research, Joanne gave capstone students, some of whom were unfamiliar with the area, a synopsis of the local culture and information on businesses in the downtown area. Despite the city council's rejection of most student recommendations, Joanne agreed that these projects

were essential to the students' professional growth. She recommended that getting the local Green Team involved in capstone projects, as Worthington's team was not aware of the students' research, would significantly improve capstone project efficacy.

Our interview with Tony Gillund, OSU's current Sustainability Manager, was very insightful. His experience as a primary stakeholder in campus-wide programs has given students who worked with him an advantage in terms of delivering proposals that are timely, realistic, and cost-effective. Tony explained how EEDS capstone students have generally succeeded in striking the balance between idealism and pragmatism when finding appropriate goals to pursue. Since Tony juggles multiple responsibilities throughout the year, he appreciates when students are able to achieve results within the course of a single semester. The AASHE STARS Program capstone in 2018 held great significance for him, as OSU currently has Gold status according to STARS rankings as a direct result of that capstone. Achieving the highest rating of Platinum, according to Tony, is one of OSU's Sustainability Department's top priorities.

As a collaborator with engineering students, Tony highlighted the importance of projects involving retrofitting buildings that are part of campus facilities. Since most EEDS students do not possess the technical knowledge to complete some of these projects, they would benefit from interdisciplinary collaboration with the engineering students. Projects focused on carbon sequestration, waste diversion, and water conservation, however, tend to lie within EEDS students' areas of expertise. Tony has hired several EEDS students who worked with him over the years, which demonstrates how producing meaningful results for OSU operations translates to consequent career success.

Students' understanding of the economic side of renewable energy projects gives teams an advantage from a competence standpoint. Skills such as the ability to calculate levelized costs

of electricity during a transition from fossil fuel sources to renewables, among others, differentiate sustainability experts from professionals with great ideas who don't have experience implementing sustainable changes. Knowledge of national and international environmental policies, as well as trade agreements and other documentation, can serve to further bolster project-specific research and recommendations.

V. Time and Resource Constraints

Time and resource constraints for past projects affected our definition of an "impactful" project and are important to note within impact assessments. Typically, there is little to no budget for capstone students' research. Groups can only conduct research based on information the project partner provides, online resources, or through methods that are already funded by the university. One method involves creating a survey using the Qualtrics online survey platform. The time constraint of only having one semester to finish a project also limits the scope of results that students are able to produce by their project's completion. While many capstone projects precipitate new capstone projects, project partners are the ones to decide whether a follow-up capstone project is viable based on their own resource availability. Project partners often encounter circumstances outside of student performance that may prohibit the project partner's involvement and implementation of the capstone recommendations. This was particularly important to consider for the capstones conducted during the COVID-19 pandemic. Many collaborators could not safely implement recommendations because of social distancing and health guidelines, or quarantine regulations caused their organization to postpone or cancel project execution. Students also had to change their projects quite abruptly in the Spring 2020 semester to adapt to the rapidly changing professional environment, but may have still had project foci incompatible with implementation during a pandemic. This is why we do not

discount projects if their recommendations were not implemented. Many impactful and high-quality projects were not realized by their project partners through no fault of the students or collaborators; the situation at the time was ultimately not conducive to the project's recommended action steps.

VI. Project Category Samples

A. Transportation

Two noteworthy projects were selected from the Transportation category; COTA: Setting the Standard and Telecommuting: Smarter Workplaces. COTA: Setting the Standard was a project from spring 2015 that partnered with the city of Columbus to highlight a series of best practices for accomplishing the city's goal of reducing the percentage of Columbus's workforce driving alone to work from 79% to 70% in the next 5 years. Over the course of their project, the capstone students also expanded their focus to creating a baseline for greenhouse gas emissions in the community transportation sector. This project was selected because the students uncovered a wealth of quantitative data. They examined several different comparable cities to Columbus and created a set of ways to improve COTA in order to increase ridership, predicting that such improvements alone could result in a 1.33% decrease in workers driving alone out of Columbus's 9% goal as well as .51-.96% decrease in greenhouse gas emissions. The students created a table listing their recommendations sorted by cost, recommended priority, and relevant comparison cities to review, as these metrics can bolster sustainability implementation plans.

Telecommuting: Smarter Workplaces was uploaded to the Knowledge Bank in may 2020 and already it is the single most downloaded project in the capstone program's history. The students collaborated with Smart Columbus to create best practices for permanently incorporating telecommuting into the workplace. This approach was in direct response to

COVID-19, and has attracted international attention with much of the downloads coming from outside the US. Our interviews with the capstone program professors brought us to this project relatively early in the process. There is a general interest in setting up a well-functioning digital workplace, and students would be wise to capitalize on this interest.

B. OSU

Projects based around OSU have a wide range of implementations across all aspects of the university's operations. A project in Spring of 2016 titled "The Ohio State University Platinum Report (2018)" aimed to measure the ways OSU could implement changes in order to achieve a platinum rating through the Association for the Advancement of Sustainability in Higher Education (AASHE) STARS program by 2018. AASHE STARS is a framework that measures higher education institutions' sustainability performances. According to the rankings, platinum is the highest standing an institution can earn. Categories the Platinum Report project recommended included improving academic curriculums and learning outcomes, food and beverage purchasing; building energy consumption, landscape management, purchasing, waste minimization and diversion, and water use. OSU accepted these measures, and the university has held a gold ranking, one rank under platinum, ever since. Although platinum was not achieved, this project helped OSU improve from its previous ranking of silver, and platinum could still be reached in future years.

Another project in the OSU category is the spring 2017 report "Smart Street Lighting: Campus Pilot." This project analyzed the possibility of installing street lights in Columbus that would likely save energy, reduce crime, and monitor air quality. This project was not accepted due to its associated costs, therefore it is interesting to observe the different ways in which the university responds to such proposals.

C. Energy

There were quite a few projects in the Energy category due to the connections to AEP through a past capstone instructor, Bruce Braine. One notable project was the "Incentives for Utility Scale Solar Energy: Recommendations for Ohio based on a Benchmark Analysis" project completed in Spring of 2020. The project assessed different policies incentivizing solar energy development in 6 states similar to Ohio: Michigan, Illinois, Indiana, Pennsylvania, Minnesota, and Tennessee. The project recommended a three-pronged approach to incentives to maximize solar sustainability beyond the recent market trends. The recommendation included traditional incentives for solar such as strengthening the state's Renewable Portfolio Standard as well as cash incentives for solar development, job development incentives, and community partnership. This project provided in-depth research that Smart Columbus did not have the resources to do themselves. The project partner reported that this was the best researched and most realistic capstone project they had seen. One of the students from this project was hired at Smart Columbus after graduation based on their performance in the capstone group.

Another remarkable project in the energy category was Economic Cost-Benefit Analysis of Smart LED Street Lights: Providing Free Public WiFi to the Linden Neighborhood which analyzed the costs and benefits of providing public Wi-Fi through streetlights in the Linden neighborhood in Columbus. The idea was proposed by a community member in a community innovation session and was almost dismissed as unrealistic. The capstone group found that public wifi in streetlights would provide $4-10 million of benefits for the Linden neighborhood through improvements in graduation and employment rates. One of the project recommendations was to continue involving the community in the decision-making process. Smart Columbus later found out that the community was concerned that people would take advantage of the free wifi and

loiter in the streets, which prevented the streetlamp project from being implemented. This demonstrates the impact of the capstone group's advice, which kept Smart Columbus from implementing a project that the community did not want. This project also has the second highest number of downloads of all the capstone projects in the Knowledge Bank, which indicates how people in Columbus, as well as people around the world, can learn from this capstone.

D. Sustainable Food

The two chosen projects from the sustainable food category were "Local and Sustainable Food Purchasing at The Ohio State University: Capstone Course Proposal" and "Sustainable Urban Agriculture for Columbus". The local and sustainable food purchasing project took place in 2016. This project group recommended that OSU add a new capstone course specifically dedicated to exploring local and sustainable food at OSU, in order to help achieve their goal of increasing the supply and purchasing of sustainable local food by 2025 to 40%. This proposed course was approved by OSU's academic board, however, it was never implemented and this course is not offered at the university to date. Nevertheless, the lack of implementation does not imply that this project, like many other projects, was unsuccessful. This project team included an in-depth syllabus for this course and completed quantitative assessments of the AESHE reports, which had lots of supporting evidence for their plan and capstone course proposal. One reason for lack of implementation was resource and time constraints of the university.

Sustainable Urban Agriculture for Columbus took place in the spring of 2014. This project group's main goal was for the city to update the city of Columbus's agriculture website to make it more interactive for farmers and gardeners in the community. A secondary goal was to research innovative agriculture in other cities across the nation to potentially use in Columbus. This project also had a very limited impact on the city of Columbus, this group mentioned in

their final report a few limitations they encountered during their project that contributed to the lack of project implementation. These factors included a lack of community engagement, issues with city zoning as well as a lack of time and resources of the city.

E. Sustainable City

Projects that fall within the Sustainable City category have historically focused on policy implementation, formation of "Green Teams," and sustainable infrastructure, to name a few goals. During the Autumn 2016 semester, the majority of the EEDS capstone projects focused on bolstering the city of Worthington's sustainability and energy efficiency initiatives. These projects utilized research on residential and commercial interests, as well as local perceptions of eco-conscious practices. Six projects focused on Worthington as their target demographic, which the former collaborator, Joanne Dole, recalled being difficult in terms of time and availability. The project our team chose as a focal point for the Worthington-focused semester was "The City of Worthington Sustainability Action Plan," which issued proposals for eco-conscious initiatives throughout the city. Worthington comprises a relatively small area compared to the urban center of Columbus, and their city council has fewer resources at their disposal. Local government officials had jobs and responsibilities take priority, as well as other pressing matters that limited the resources they could relay to capstone students.

An additional stressor from this category originated from residents feeling the effects of a phenomenon called "survey fatigue." During the "Mobile Equity Analysis of Electric Scooters in Columbus" project, which took place in the spring of 2019, residents of Linden and Clintonville expressed discontent with being over-studied after several groups of students surveyed them in a single year.. Although this feedback is valid and insightful, performing comprehensive, place-

based research is not possible without including residents' opinions, as they are active stakeholders in their respective communities.

F. Recycling and Waste

Projects that we categorized as recycling and waste reduction initiatives have had a variety of different outcomes across past semesters. The first project "Moving Towards Zero Waste at The Ohio State University Wexner Medical Center", took place in 2020. The main goal of that project was to eliminate 90% waste in the OSU Wexner by 2050. This project recommended two types of software that Wexner Medical could use to help achieve waste reduction goals, as well as creating a waste reduction plan. Although there has been quite a bit of progress regarding waste reduction at the Wexner, this project's main limitation is time. The ongoing project is still relatively new, and there have not been any significant impacts resulting from student recommendations.

Another noteworthy project in the recycling and waste category, "Creating a Zero Waste Culture: Responsible Reuse and Recycling", took place in the spring of 2016. This project had the main goal of minimizing waste by creating a marketing campaign that focused on educating students on what materials can and cannot be recycled and to reduce recycling contamination on campus. One recommendation of this project was for OSU to provide reusable items like water bottles to incoming students to help eliminate some waste. In 2017 a campus organization, Students for Recycling, partnered with the OSU Office of Energy Management and Sustainability and Coca-Cola in 2017 and established a bottle exchange program where students could get a reusable water bottle. This project may have been an influencing factor for this program, although it is difficult to assess quantitative results regarding how much waste this project has helped to avert on OSU's campus. Regarding the marketing campaign

recommendations from the Creating a Zero Waste Culture project, campus-wide marketing campaigns featuring recycling initiatives have increased substantially. The example poster that this student group created has been used on OSU's campus for recent campaigns. A simple Google search on what to recycle at OSU would produce the poster image on the first page of links.

G. Health

The first project in the health category entitled "Prenatal Trip Assistance Cost Analysis", occurred in 2018. This group worked with Smart Columbus to investigate third party non-emergency medical transportation companies to use for Smart Columbus' program to help get expectant mothers to prenatal appointments to reduce infant-mortality rates. After researching various transportation companies the group recommended two companies: Veyo and Circulation. This project's recommendation was successfully implemented, as Smart Columbus utilized Veyo as one of their NEMT (non-emergency medical transportation) services. This program, called Ride4babies, launched in 2019 and ran through January 2021. It was very successful in helping reduce rates of infant-mortality in Franklin county while helping 143 women in need (*Prenatal trip assistance: Smart Columbus,* n.d.*).*

The final project in the health category "Waste Averted and Cleaner Energy: The Future of Telehealth at The Ohio State University Wexner Medical Center" took place in spring of 2021. This project group researched telehealth at the OSU Wexner Medical Center and evaluated the amount of waste averted due to telehealth. The waste averted results found were significant and this group recommended that the Wexner continue telehealth appointments in order to keep reducing the Wexner's waste. The students also researched a business case for a renewable energy microgrid, which would provide energy to power a telehealth robot and recommended the

Wexner continue to look into a location for this microgrid to be installed. The impact of this project has been limited so far, but the projected benefits from implementation may continue to produce favorable results in the coming years. The Wexner is continuing with telehealth appointments to date, however this likely would have happened regardless of the project group's recommendations due to COVID-19 and the convenience of these virtual visits. As for the renewable energy microgrid, there has yet to be any construction or plan but there may be more advancements of this proposal in future years.

VII. Project Downloads and International Attention

One potential success measurement factor we found interesting to investigate was statistical data of downloads for all projects, including international downloads. On the OSU knowledge bank website statistics are given of the number of downloads, and the countries in the past six months in which the project reports were downloaded. This data was collected for every capstone project and accounted for in our categorized excel sheet. There were a few projects that stood out significantly with the amount of international attention as well as number of downloads.

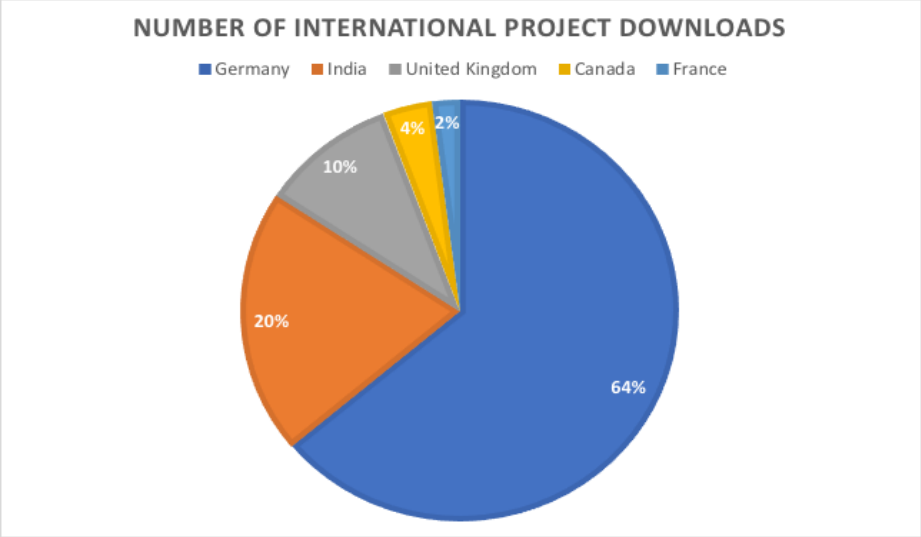

Figure 1. Percentage of Non-U.S. Project Downloads by IP Address

The project with the most international attention is “Electronic Autonomous Vehicle Case Study Analysis” from the spring semester of 2017. This project received the most international attention from Germany, with the most downloads being in Germany rather than the United States. Many other projects had similar statistics with a majority of downloads in international countries, we found that the 5 international countries with the most downloads were Germany, Canada, U.K., India and France. Although it is interesting to analyze the statistics of downloads for each project, there is no system to figure out the purpose of each download, therefore, there are some limitations of using this element to determine a project’s success.

VIII. Conclusion and Recommendations

Throughout this project, we have learned about many different capstone projects, as well as many contributing factors to what makes them successful. After working through many steps of analysis of each project, we have concluded that each project's success was not directly correlated to whether the student team’s recommendations were implemented. There were many other factors that inhibited successful projects from being implemented, including time and resource constraints, the pandemic, and project partners’ external commitments. Each project, even those within similar categories that utilized similar methods, varied drastically. No two projects were categorically identical. Using this information, we formulated our recommendations for future capstone classes that could expand on this project to do a deeper dive, as well as recommendations for all future capstone students and professors to ensure that projects are set up for maximum efficacy.

The first recommendation for future capstone professors and classes is to ensure that there are many project partners working with groups of students, rather than just one partner. It is essential to ensure that not all the projects from a term come from the same partner, as it creates

an extreme constraint on time and resources for that partner and, as a result, project's are less likely to be implemented. When this occurred in 2016, it was not due to the fact that the projects were not successful and completed well. The project partner at the time could only allot so much time and resources to each project, which made the implication process much more difficult than normal.

Another recommendation that would benefit future projects is for SENR to create interdisciplinary projects with other colleges like the Knowlton School of Architecture, the College of Engineering, and others. This would help projects to be more diverse and allow for more elaborate projects, utilizing skills and knowledge from many different majors.

For future capstone projects we also recommend a few different project ideas to be completed as legacy projects. One project idea could be looking into capstone projects effects on forgein policy and the impact on governments abroad. Another project that future capstone students could complete is doing a deeper analysis on the categorization of projects. Our final recommendation from this project is to establish a system for partner projects that could directly give students feedback on the projects and update any implementations. This system could help students to be aware of the impacts their projects are making in the local community.

IX. Sources

Knowledge Bank. The Ohio State University Libraries. (n.d.). Retrieved November 22, 2021, from https://kb.osu.edu/discover.

Prenatal trip assistance: Smart Columbus. Smart Columbus. (n.d.). Retrieved November 22, 2021, from https://smart.columbus.gov/projects/prenatal-trip-assistance.

X. Appendix

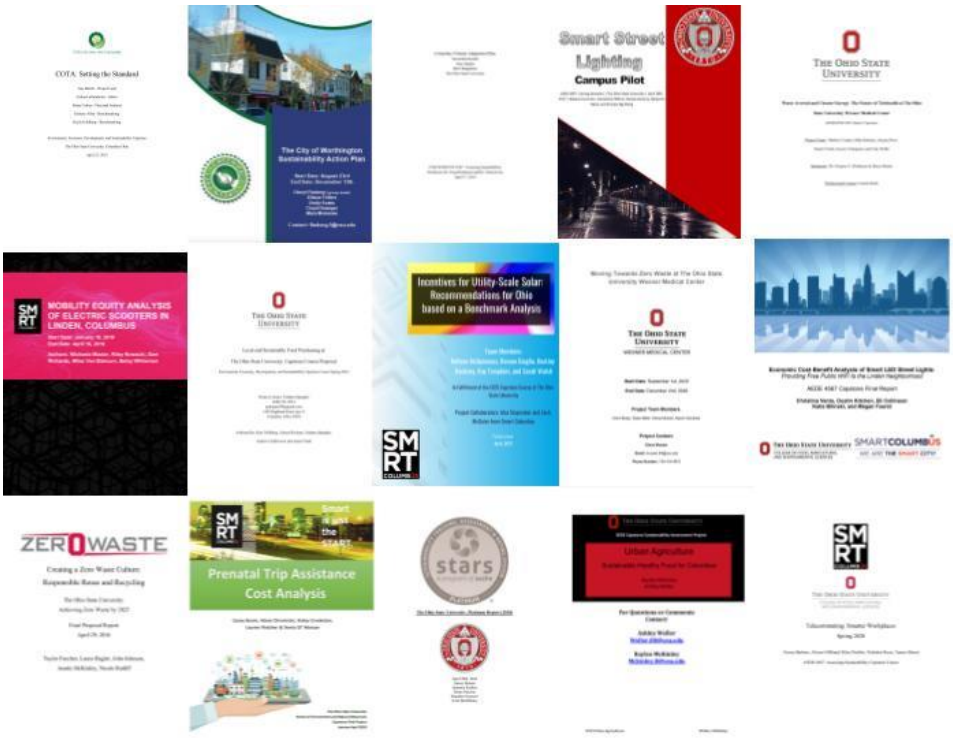

Figure 3. Cover Pages of EEDS Capstone Projects

Interviewing Questions:

EEDS Professors Past and Current

On a scale of 1 to 10 generally (1 least, 10 most), how effective or impactful were projects that you oversaw?

Is there one or more projects that stand out in your mind that have been particularly impactful (ie. received very positive or negative collaborator feedback, propelled campus initiatives and the recommendations were well-received)?

Are there any aspects of the capstone class that you found lacking in terms of professional development, application of student knowledge, or any other area?

What would you recommend to future capstone students and professors going forward?

EEDS Alumni

What are the most valuable skills you have learned from your Capstone experience?

For those who found employment through their Capstone: How has the Capstone influenced your current career path? What impressed your employer the most about your work?

When you completed your capstone project, how did your results differ from your intended outcomes? Did you consider the project effective, and why?

How could you see the impact of the capstone project being expanded – how could it impact global climate change on an expansive level?

What would you suggest to future capstone classes knowing what you know after the capstone project is completed?

Would a system in which your collaborators provide feedback about updated implementations after your project be helpful?

Past and Current Collaborators

How did your experiences with Capstone students determine your satisfaction with project outcomes?

Were there any recurring themes in terms of relative project success?

What recommendations would you give other collaborators and Capstone groups when defining project scope?

On a scale of 1 to 10 generally (1 least, 10 most), how effective or impactful were action plans and recommendations that Capstone students developed for your project(s)?

Did you hire any students who completed a Capstone project under your supervision? What made them stand out among their peers?

Which projects were not as effective in achieving your organization's goals, and why?

When did a lack of communication occur during project progress, and what kind of effect did that have on the student group's recommendations?